

1980 Highly Scalable Software-Based Architecture For Communication And  
Cooperation Among Distributed Electronic Agents

### ABSTRACT

1985 A highly flexible, software-based architecture is disclosed for  
constructing distributed systems. The architecture supports cooperative  
task completion by flexible, dynamic configurations of autonomous  
electronic agents. Communication and cooperation between agents are  
brokered by one or more facilitators, which are responsible for matching  
requests, from users and agents, with descriptions of the capabilities of  
other agents. It is not generally required that a user or agent know the  
1990 identities, locations, or number of other agents involved in satisfying a  
request, and relatively minimal effort is involved in incorporating new  
agents and "wrapping" legacy applications. Extreme flexibility is  
achieved through an architecture organized around the declaration of  
capabilities by service-providing agents, the construction of arbitrarily  
1995 complex goals by users and service-requesting agents, and the role of  
facilitators in delegating and coordinating the satisfaction of these goals,  
subject to advice and constraints that may accompany them. Additional  
mechanisms and features include facilities for creating and maintaining  
shared repositories of data; the use of triggers to instantiate commitments  
2000 within and between agents; agent-based provision of multi-modal user  
interfaces, including natural language; and built-in support for including  
the user as a privileged member of the agent community. Specialized  
embodiments providing enhanced scalability are also described.